

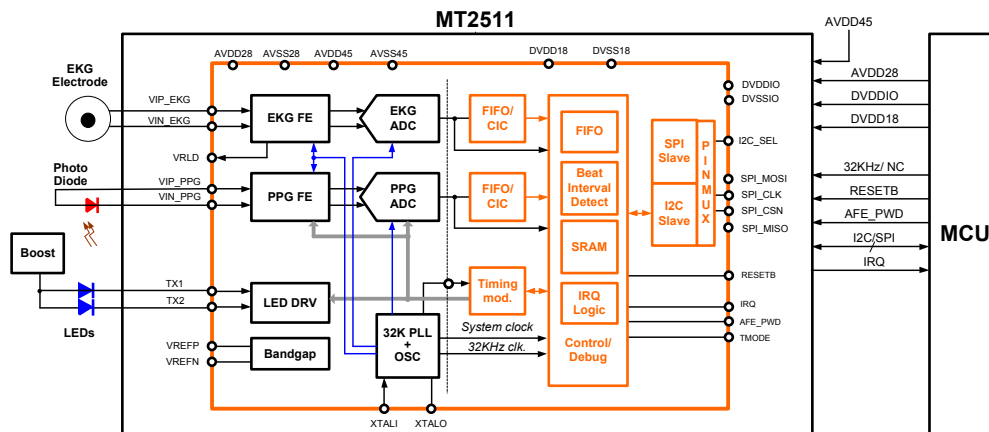
PRODUCT OVERVIEW

MediaTek MT2511 is a 2-in-1 biosensing analog front-end (AFE). The AFE consists of low noise voltage and current sensing channels and supports measuring Electrocardiography (EKG) and Photoplethysmography (PPG) simultaneously.

Each of the two AFE channels in MT2511 has a dynamic range greater than 100dB and can detect pulses accurately by sensing the electric signals of heartbeats in an environment with interferences and motion artifacts, and complementing the detection optically by illuminating the skin and measuring the changes in light absorption.

MT2511 is equipped with built-in heartbeat interval estimation for PPG signals and SRAM for power consumption optimization for heart rate monitoring during sleep mode. This allows the external MCU to stay in idle mode for up to four minutes without motion artifact cancellation.

With its small package size (3.1mm x 3.4mm) and low power consumption, MT2511 is suitable for various types of wearable devices, particularly fitness trackers, active lifestyle smart watches and sports bands. It is also suitable for next-generation health and wellness devices such as smart medical patches and smart clothing for the emerging eldercare segment.



MT2511 system architecture

BENEFITS

- 2-in-1 biosensing AFE (voltage or current)
- Built-in heartbeat interval detection circuit
- Integrated oscillator to offer high-precision clock with external crystal oscillator
- Dynamic power down for power saving operations
- Two-electrode (2E) mode and right leg drive (RLD) mode for EKG sensing

TARGET APPLICATIONS

- Sport heart rate monitor
- Sleep monitor
- Blood pressure

FEATURES

EKG Channel

- High-resolution DC-coupled front-end
- Wide input offset and large interference tolerance
- Supports electrode impedances in a range from 0 to 50 Ω
- 500M Ω input impedance
- Supports right-leg drive (RLD) mode to reach medical-grade EKG sensing
- Built-in 384-entry FIFO for data buffering, each entry is 24 bits of input sensor data.

PPG Channel

- Supports 2 channel or 1 channel mode
- Built-in LED drivers
- High-resolution DC-coupled current-mode front-end
- Flexible timing control for the PPG channel

- Heart rate variation (HRV)
- Electromyography (EMG)
- Electroencephalography (EEG)

- Built-in 384-entry FIFO for data buffering, each entry is 24 bits of input sensor data.

Heartbeat Interval Estimation

- Built-in heartbeat interval estimation for PPG signals and SRAM for power consumption optimization for heart rate monitoring during sleep mode
- Allows the external MCU to stay in idle mode for up to four minutes without motion artifact cancellation

Connectivity

- MT2511 supports I2C/SPI dual interfaces

Package

- 3.1mm × 3.4mm, 56-ball, 0.4mm pitch, WLCSP package